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Notes on plants of the southern United States—III

FRANCIS W. PENNELL

As with preceding issues this paper divides itself into two portions. One consists of short notes based upon the writer's field work of 1912 and 1913, recording mostly plants believed new to their respective states. The other and larger portion consists of a revision of the genus *Chamaecrista* in the United States, and for this have been reviewed, besides his own collections, all the material in several of our leading herbaria. In both parts symbols are used; > to indicate in flower; <, in fruit.

MISCELLANEOUS SPECIES

ARISTOLOCHIA LONGIFLORA Engelm. & Gray

Not "*A. longifolia*," as it appears in Coulter, Botany of Western Texas (Contr. U. S. Nat. Herb. 2), and in Small, Flora of the Southeastern United States. Collected near its original station, on dry black loam, Edwards Plateau, northwest of New Braunfels, Comal County, Texas, September 14, 1913, 5435.

ACTAEA ALBA (L.) Mill.

Deciduous woodland, Catalpa, West Feliciana Parish, Louisiana, August 22, 1912, 4309. With a large number of northern species, such as *Asplenium pycnocarpon* Spreng., this reaches its southern limit in the loess hills east of the Mississippi River in Louisiana.

CRACCA AMBIGUA (M. A. Curtis) Kuntze

Open long-leaf pine-land, one to two miles north of Abita Springs, St. Tammany Parish, Louisiana, > August 12, 1912, 4136.

Cracca angustifolia (Featherman) Pennell, comb. nov.

Tephrosia angustifolia Featherman, Bot. Rep. Louisiana 73. 1871.

"Habitat.—Pine barrens near Pontchatoula [Louisiana]." From inquiry at Baton Rouge it seems probable that Featherman's type is not in existence.

Cracca onobrychoides (Nutt.) Kuntze as it occurs in central and western Arkansas and eastern Oklahoma is relatively a stout plant, its stem and leaf-rhachises hirsute with more or less spreading rusty hairs, its leaflets mostly nine to twelve pairs, elliptic-oblong, densely and softly pubescent beneath. The plant here considered, for which is taken up Featherman's name, is more slender, its stem and leaf-rhachises shortly pubescent with appressed or but slightly spreading hairs, giving by their more scattered position the effect of being less rusty, its leaflets six to nine pairs, linear-oblong. This is probably a characteristic plant of the long-leaf pine-land in Louisiana and Mississippi; we have it from Gulfport, Harrison County, Mississippi, < September 8, 1900, *F. E. Lloyd & S. M. Tracy* 161, and from open pine-land, one to two miles north of Abita Springs, St. Tammany Parish, Louisiana, < August 14, 1912, 4189. Its specific status is here proposed tentatively. Specimens of *C. onobrychoides* collected on prairies in Bowie County, Texas, in 1898, *H. Eggert*, and at Hempstead, Waller County, Texas, *E. Hall* 119, in pubescence and leaf-form show possible first stages of transition toward *C. angustifolia*. The plant needs further field-study.

EYSENHARDTIA TEXANA Scheele

The single species of *Eysenhardtia* occurring through most of central southern Texas is this, based upon Lindheimer's collection at New Braunfels, Texas. It has been confused with the central Mexican *E. polystachya* (Ortega) Sargent (*E. amorphioides* H.B.K.), but is a smaller plant, a shrub rather than a small tree, its leaflets fewer in number, finely puberulent rather than pubescent, its calyx-tube split on posterior side relatively more deeply and its legumes smaller, evidently upcurved, at maturity ascending, not reflexed. Mr. W. E. Safford and the writer are planning a revision of this small but neglected genus. On black calcareous soil, Edwards Plateau, northwest of New Braunfels, Comal County, Texas, > September 14, 1913, 5468.

ZORNIA DIPHYLLA (L.) Pers.

Sandy soil, one mile east of Aloe, Victoria County, Texas, > September 18, 1913, 5491. A tropical species, West Indian and

Mexican, extending into southern Arizona, but, so far as I am aware, not before reported from the Gulf States.

LESPEDEZA HIRTA (L.) Ell.

Dry sandy oak-woods west of Sheridan, Colorado County, Texas, collected $\geq$ September 21, 1913, 5523.

GALACTIA MARGINALIS Benth. Ann. Wien. Mus. 2: 126. 1838

Perhaps *G. heterophylla* (Gill.) Vail (Bull. Torrey Club 22: 502. 1895), but not *G. heterophylla* A. Gray (Boston Jour. Nat. Hist. 6: 171. 1850).

Sandy soil, one mile east of Aloe, Victoria County, Texas, > September 18, 1913, 5497.

THE GENUS CHAMAECRISTA MOENCH IN THE UNITED STATES

During my two southern trips especial attention was given to the genus *Chamaecrista* Moench. This genus or, if you will, subgenus of *Cassia* L. has long been known as of particular taxonomic difficulty. As long ago as 1871 Bentham in his revision of *Cassia* emphasized this. Hence it has seemed desirable to see living plants and to study the behavior of the several species.

From the following lists the extent and deficiencies of this field-work will be apparent. I have collected nearly all the species in my course, but, as I did not travel west of central Texas or south into the Florida peninsula, I have seen but six of the thirteen species here recognized.

However, these six include all of the wide-ranging, widely variable sorts, and, as in this genus the characters of diagnostic value preserve well, the main importance of field-study has been to form some appraisalment of variation within and between species. Of the geographic subspecies here treated, six in all, the writer has collected three.

Corolla large, exceeding 1 cm. in diameter; one petal only moderately longer than remaining four. Stamens 10. Pedicels 1-8, 7-40 mm. long.

Perennials.

Petiolar gland slender-stalked.

Leaflets 7-9 mm. long, rounded-mucronulate,

- glabrous, reddish beneath. Pedicels 30-40 mm. long. Sepals ovate. Legumes 30-40 mm. long, finely appressed-puberulent.
1. *C. Wrightii*.
- Leaflets 8-11 mm. long, acute-mucronate, ciliate, green beneath. Pedicels 7-9 mm. long. Sepals lanceolate-attenuate. Legumes 35-40 mm. long, strigose.
2. *C. aristellata*.
- Petiolar gland sessile.
- Pedicel 1, 25-35 mm. long, exceeding the leaves. Sepals ovate. Stipules ovate. Leaflets strongly ridge-veined.
3. *C. texana*.
- Pedicels 1-4, 15-25 mm. long, shorter than the leaves. Sepals lanceolate. Stipules lanceolate-linear. Leaflets not strongly ridge-veined.
- Leaflets 4-7 pairs, not ridge-veined, pubescent. Petiolar gland small. Pedicels spreading-pubescent. Legumes 3.5-4 cm. long, pubescent.
4. *C. keyensis*.
- Leaflets 12-20 pairs, finely ridge-veined, glabrous. Petiolar glands large, 1-2 mm. long. Pedicels glabrous to finely appressed-puberulent. Legumes 6.5-8.5 cm. long, sparsely finely appressed-puberulent.
5. *C. Deeringiana*.
- Annuals.
- Petiolar gland depressed, 1-2.5 mm. wide. Pedicels glabrous to more rarely puberulent in lines. Leaflets 10-25 pairs.
6. *C. brachiata*.
- Petiolar gland not depressed, 0.07-1.5 mm. wide. Pedicels puberulent to hirsute. Leaflets 6-12(-18) pairs. Species closely related and more or less intergrading.
- Leaflets glabrous (occasionally slightly puberulent in *C. fasciculata*). Legumes 3-7 cm. long, 5-7 mm. wide.
- Anther-sacs purple. Petiolar gland minute, 0.07-0.2 mm. wide. Leaflets 5-9 pairs. Buds ovate, acute to short-acuminate. Legume relatively long-beaked. Pedicels appressed-pubescent. Plant low.
7. *C. rostrata*.
- Anther-sacs yellow (rarely purplish in *C. fasciculata*). Petiolar gland 0.5-1.5 mm. wide. Leaflets 6-12(-18) pairs. Buds lanceolate to ovate-lanceolate, strongly acuminate. Legumes relatively short-beaked.
- Pedicels and stems pubescent with in-

- curved hairs. Legumes pubescent with relatively short and appressed hairs. Leaflets 6-12(-15) pairs. Corolla 25-30 mm. wide. 8. *C. fasciculata*.
- Pedicels and stems hirsute with spreading hairs. Legumes pubescent with spreading hairs. Leaflets 9-18 pairs, 15-20 mm. long. Corolla mostly 30-40 mm. wide. Stems stout, erect. 8a. *C. fasciculata* β .
- Leaflets 6-10 pairs, 8-12 mm. long. Corolla about 25 mm. wide. Stems slender, spreading. 8b. *C. fasciculata* γ .
- Leaflets pubescent with incurved hairs. Anther-sacs yellow. Legumes 3-5 cm. long, 5 mm. wide. Plants relatively small-leaved, slender and spreading. Pedicels and legumes pubescent with incurved hairs. 9. *C. mississippiensis*.
- Pedicels and legumes pubescent with spreading hairs. 9a. *C. mississippiensis* β .
- Anther-sacs purple. Legumes 5-6 cm. long, 4-5 mm. wide. Plant relatively large-leaved, stouter and erect. 10. *C. puberula*.
- Corolla small, less than 1 cm. in diameter; one petal much larger than the remaining four. Stamens 5-9. Pedicels 1-2(-3), 2-5 mm. long. Annuals. Legumes 3-4 mm. wide, 10- to 18-seeded. Leaflets long-ciliate. Odd petal not twice length of others. 11. *C. leptadenia*.
- Legumes 4-6 mm. wide, 6- to 9-seeded. Leaflets not ciliate. Petiolar gland with discoid head much wider than stalk-like base. Corolla with odd petal twice exceeding others. Legumes 7- to 9-seeded, pubescent with incurved (rarely spreading) hairs. Stem pubescent with ascending-incurved, rarely with spreading hairs. Leaflets glabrous, obtuse, mucronate. Sepals puberulent on midrib. Stipules 5-8 mm. long. 12. *C. nictitans*.
- Leaflets 9-18 pairs, 2-4 mm. wide. 12a. *C. nictitans* β .
- Leaflets 15-26 pairs, 1-2 mm. wide. Leaflets pubescent with incurved hairs, acutish to acute, more conspicuously mucronate-tipped. Sepals pubescent on midrib. Stipules 8-10 mm. long. 12b. *C. nictitans* γ .
- Petiolar gland with head but slightly wider than stalk-like base. Corolla with odd petal less

than twice exceeding others. Legumes 6-10
 7-seeded, hirsute with spreading hairs. Stem,
 at least above, hirsute with spreading hairs.
 Leaflets 15-27 pairs. Stout, erect, mostly
 hirsute throughout. 13. *C. aspera*.
 Leaflets 9-18 pairs. Slender, diffuse, mostly
 hirsute only above. 13a. *C. aspera* β .

1. **Chamaecrista Wrightii** (A. Gray) Pennell, comb. nov.

Cassia (*Chamaecrista*) *Wrightii* A. Gray, Pl. Wright. 2: 50. Mr
 1850.

"Hill-sides, on the Sonoita, near Deserter Rancho, Sonora;
 Sept. [C. Wright] (1034)." Co-types seen in the herbarium of
 Columbia University at the New York Botanical Garden and in
 the herbarium of the Academy of Natural Sciences of Philadelphia.

Perennial. Stem ascending, 3-4 dm. tall, finely puberulent in
 lines with incurved to appressed hairs. Stipules lanceolate-
 acuminate, very shortly or not ciliate, 3-4 mm. long. Petioles 3-4
 mm. long, slightly puberulent. Petiolar gland single, below
 proximal leaflets, conspicuously stalked, discoid, 0.15-0.2 mm.
 wide, dark-brown. Leaflets six to eight pairs, 8-10 mm. long, 2
 mm. wide, obliquely ellipsoid-lanceolate, rounded, very shortly
 mucronulate, glabrous, not ciliate, obscurely nerved. Pedicel
 one, 30-40 mm. long, sparingly puberulent in lines with incurved
 hairs. Sepals 7 mm. long, ovate, acute. Petals 10-12 mm. long,
 the anterior slightly exceeding the laterals. Stamens ten, unequal,
 two longer; anthers 6-8 mm. long, gradually narrowed above,
 yellow (?). Legumes 4 cm. long, 5 mm. wide, sparingly finely
 appressed-puberulent. Seeds eight.

"Hill-sides," northeastern Sonora and southern Arizona.

ARIZONA. Without definite locality, J. T. Rothrock, 1874,
 4750 ft. alt. (U).

2. **Chamaecrista aristellata** Pennell, sp. nov.

Cassia aristellata A. Gray, manuscript name on sheet here taken as
 type.

Perennial. Stem ascending, 4 dm. tall, puberulent with in-
 curved hairs and hirsute with interspersed longer spreading hairs.
 Stipules lanceolate-acuminate, long-ciliate, 5 mm. long. Petioles
 3-5 mm. long, hirsute. Petiolar gland single, slightly below
 proximal leaflets, conspicuously slender-stalked, discoid, 1-1.5
 mm. wide. Leaflets six to eight pairs, 10-15 mm. long, 2 mm.

wide, oblique-lanceolate, falcate, acuminate-mucronate on distal side, nearly glabrous, evidently ciliate, evidently nerved. Pedicel one, 7-13 mm. long, appressed-puberulent with incurved hairs. Sepals 10-11 mm. long, lanceolate, acuminate, puberulent. Petals 10 mm. long, the anterior slightly exceeding the lateral. Stamens unequal. Legumes 4 cm. long, 4-4.5 mm. wide, strigose-hirsute, brown. Seeds twelve, 2-2.2 mm. long, oval.

Type, "Texano-Mexicanum," collected in fruit, *Berlandier* 2036, in the herbarium of Columbia University at the New York Botanical Garden.

Apparently differs from *Chamaecrista calycioides* (DC.) Greene of South America, with which it has been confused, by its fewer leaflets and solitary flowers; doubtless, when *C. calycoides* is re-collected and fully described, by other characters.

Besides the type collection, the precise locality of which is unrecorded, seen also from Cameron County, Texas, > May 8, 1900, *Vernon Bailey* 231, in the United States National Herbarium.

3. *Chamaecrista texana* (Buckl.) Pennell, comb. nov.

Cassia texana Buckl. Proc. Acad. Nat. Sci. of Phila. 1861: 452.

1862. "Sandy soil, Bastrop Co., Texas." Type seen in the herbarium of the Academy of Natural Sciences of Philadelphia.

Perennial, from a rhizome. Stems ascending, 2-4 dm. long, puberulent in lines with ascending-incurved hairs. Stipules cordate-triangular, acuminate, slightly ridge-veined, puberulent, ciliate, 3-4 mm. long. Petioles 2-3 mm. long, puberulent with ascending-incurved hairs. Petiolar gland single, below proximal leaflets, sessile, rudimentary or mostly wanting. Leaflets ten to sixteen pairs, crowded, 6-8 mm. long, 1 mm. wide, elliptic-lanceolate, acutish, pubescent, finely ciliate, strongly ridge-veined. Pedicel one, exceeding the subtending leaf, in fruit 30-50 mm. long, puberulent with incurved hairs. Sepals 7-8 mm. long, ovate, acute, finely appressed-puberulent. Petals 10-13 mm. long, the anterior slightly exceeding the laterals. Stamens ten, unequal, one or two longer; anthers 6 mm. long, yellow. Legumes 3-4 cm. long, 5 mm. wide, sparingly finely appressed-pubescent. Seeds eight.

This has been identified as *C. chamaecristoides* and as *C. procumbens*.

C. chamaecristoides (Collad.) Greene, of South America, differs by its longer stouter stems, lanceolate stipules, slightly longer

petioles, evident stalked petiolar gland, rounded not winged leaf-rachis (in *C. texana* this is flattened, slightly winged), larger scarcely veined evidently cuspidate leaflets, stouter densely puberulent pedicels shorter than the subtending leaves, and flowers larger, 30–35 mm. in diameter.

C. micrantha Britton (" *C. procumbens*," not L.), of Cuba and the Isle of Pines, differs by its ovate-lanceolate stipules, evident petiolar gland, terete not winged leaf-rachis, shorter scarcely veined usually more puberulent to pubescent leaflets, peduncles becoming but 10–20 mm. long, smaller flowers 15 mm. in diameter, and more puberulent eight- to twelve-seeded legumes.

Dry sandy soil, southern Texas.

TEXAS. Bastrop:* *S. B. Buckley* (A). Cameron: Rudolph, *F. L. Lewton* 178 > April 13 (U). Duval: Pena, *G. C. Nealley* 117 (P, U). Victoria: Aloe, *F. W. Pennell* 5496 > September 18 (P). Webb: Laredo, *Schott* 105 > June (Y). Also "De Matamoros a las Nueces," *Berlandier* 2427 (A, U, Y).

4. *Chamaecrista keyensis* Pennell, sp. nov.

Perennial. Stems spreading, 1–8 dm. long, densely pubescent with spreading hairs. Stipules lanceolate-acuminate, 4.5–5 mm. long. Petioles 3–6 mm. long, densely spreading-pubescent. Petiolar gland single, toward distal end of petiole, sessile, more or less raised, saucer-shaped. Leaflets four to seven pairs, 7–10 mm. long, 2–4 mm. wide, oblanceolate, mucronate, densely pubescent with somewhat incurved hairs. Pedicels one or two, 15–20 mm. long, pubescent with spreading upcurved hairs. Sepals 8–9 mm. long, lanceolate-acuminate, hirsute. Petals 9–10 mm. long, the anterior but slightly exceeding the laterals. Stamens ten, unequal; anthers 7–8 mm. long, gradually narrowed above, reddish-purple. Legumes 4–4.5 cm. long, 4–5 mm. wide, puberulent with incurved hairs. Seeds twelve, 3 mm. long.

Type, rocky pine woods, Big Pine Key, Monroe County, Florida, collected in flower May 2, 1917, *F. W. Pennell* 9553 in the herbarium of the New York Botanical Garden.

The Antillean *C. grammica* (Spreng.) Pollard, with which this has been identified, differs by its appressed pubescence and conspicuously stalked glands.

* As in preceding lists, one specimen (rarely several) from a county is cited, county-names being arranged alphabetically. For herbaria cited see Bull. Torrey Club 43: 94. 1916.

Rocky or sandy pine-lands, Florida Keys.

FLORIDA. Monroe: Big Pine Key, *J. K. Small* 3785, 3790 < November 17 (Y); No-name Key (U, Y); Ramrod Key (Y).

5. **Chamaecrista Deeringiana** Small & Pennell, sp. nov.

Perennial, from a horizontal rhizome. Stems erect, slender, purple or purplish, 3–6 dm. tall, glabrous or sparingly puberulent above with incurved hairs. Stipules strongly ridge-veined, glabrous, 7–10 mm. long. Petioles 5–8 mm. long, sparingly appressed-puberulent to glabrous. Petiolar gland single, depressed-discoid, 1–1.5 mm. wide, brown. Leaflets 10–20 pairs, 10–20 mm. long, 2–3 mm. wide, lanceolate-linear, acute-mucronate, glabrous, not ciliate, shining, finely ascending ridge-nerved; midrib excentric. Pedicels one to four in a fascicle, 10–20 mm. long, very slender, glabrous to more rarely sparingly puberulent in lines with incurved hairs. Sepals 10–12 mm. long, lanceolate, acuminate, not dilated nor white-margined below, glabrous to finely pulverulent. Petals 14–18 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, 2 longer; anthers 8–9 mm. long, yellow or reddish. Legumes 6.5–8.5 cm. long, 5 mm. wide, 1 mm. thick, brown, thick-walled (seed-cavities scarcely visible externally), sparingly finely appressed-puberulent to glabrous. Seeds twelve to fifteen, 3.8–4 mm. long, dark purplish-brown.

Type, pine-lands near Silver Palm, Dade County, Florida, collected in flower and fruit June 22, 1915, *J. K. Small, C. A. Mosier & G. K. Small* 6454, in the herbarium of the New York Botanical Garden.

Has been confused with *C. brachiata*.

Pine-lands on Miami limestone, mainland, and on Big Pine Key, southern Florida.

FLORIDA. Dade: Brogdon Hammock; Cocoanut Grove; Cutler; Homestead; Long Prairie; Miami, *N. L. Britton* 197 > March 24 (Y); Murden Hammock; Silver Palm; near Timms Hammock, *F. W. Pennell* 9540 > April 28 (Y). Monroe: Big Pine Key, *J. K. Small* 3781 $\geq$ November 17, (Y).

6. **CHAMAECRISTA BRACHIATA** Pollard

Chamaecrista brachiata Pollard, Proc. Biol. Soc. Wash. 15: 20. Feb. 18, 1902. "Type, No. 330,115, in the United States National Herbarium, collected by Charles L. Pollard and G. N.

Collins at Miami, Dade County, Florida, April 4-7, 1898 (No. 245)." Type seen in the United States National Herbarium.

Annual. Stems erect, 8-12 dm. tall, glabrous or sparingly puberulent above with incurved hairs. Stipules lanceolate-acuminate, glabrous or nearly so, not ciliate, 5-8 mm. long. Petioles 4-8 mm. long, sparingly appressed-puberulent to glabrous. Petiolar gland single, or occasionally two or three and serially placed, closely sessile, effused-disoid to saucer-shaped, 1-2.5 mm. wide, brown. Leaflets ten to twenty-five pairs, 10-20 mm. long, 2-3 mm. wide, linear-lanceolate, acute-mucronate, glabrous, not ciliate, obscurely nerved. Pedicels 1-4 in a fascicle, 10-20 mm. long, glabrous to more rarely sparingly puberulent in lines with incurved hairs. Sepals 10-12 mm. long, lanceolate, acuminate, glabrous or nearly so. Petals 10-18 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, 2 longer; anthers 7-9 mm. long, reddish to purplish (?). Legumes 6-8 cm. long, 5-5.5 mm. wide, sparingly finely appressed-puberulent. Seeds fifteen to eighteen, 3-3.2 mm. long, dark brown.

Dry pine-land, peninsular Florida (perhaps also in southern Alabama).

FLORIDA. Brevard: Merritt's Island, *A. A. Baldwin* 23 < September 1 (A). Dade: Miami, *C. L. Pollard & G. N. Collins* 245 < April 4-7 (U, Y). Duval: Jacksonville, *A. H. Curtiss* 5156 > August 27 (U, Y). Hillsboro: Tampa, *N. L. Britton & P. Wilson* 7 $\geq$ August 25 (Y). Lake: Eustis, *G. V. Nash* 701 > May 1-15 (U, Y). Lee: Pine Island, *S. M. Tracy* 7242 > May 14 (P, U, Y). Manatee: Bradentown, *S. M. Tracy* 7089 > June 15 (P, U, Y). Marion: Fort King, *Lieut. Alden* (Y). Orange: Clarcona, *M. Meislahn* 127 $\geq$ November 30 (U). Pinellas: Clearwater Key, *S. M. Tracy* 6536 > April 21 (U). Polk: Lakeland, *Mrs. T. Meehan* $\geq$ March (A). Ste. Lucie: Fort Pierce, *A. B. Burgess* 724 > April 8-9 (Y). Suwanee: Live Oak, *F. W. Pennell* 9799 > May 23 (Y).

(?) ALABAMA. Baldwin: Bay Minette, *J. M. Macfarlane & O. Goertz* > June 15 (P), apparently this, but petiolar gland is quite small.

7. CHAMAECRISTA ROSTRATA Wooton & Standley

Chamaecrista rostrata Wooton & Standley, Contrib. U. S. Nat. Herb. 16: 135. F 12 1913. "Type in the U. S. National

Herbarium, no. 660032, collected in sandy soil at Logan [New Mexico], October 5, 1910, by Mr. Geo. L. Fisher (no. 93)."

Type seen in United States National Herbarium.

Annual. Stem erect, 1-3 dm. tall, branched, finely puberulent over entire surface with ascending-incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, slightly ciliate, nerved, 4-6 mm. long. Petioles 2-4 mm. long, finely puberulent with incurved hairs. Petiolar gland single, toward distal end of petiole, sessile, slightly saucer-shaped, 0.07-0.2 mm. wide, brown. Leaflets five to nine pairs, 7-12 mm. long, 2-3 mm. wide, oblong, obtuse, shortly mucronulate, glabrous, scarcely finely ciliolate, paler beneath, faintly nerved. Bracteoles 2-3 mm. long, lanceolate-attenuate. Pedicels one or two in a fascicle, 7-10 mm. long, finely puberulent with incurved hairs. Sepals 7-10 mm. long, ovate-acuminate, puberulent on the midrib. Petals 10-15 mm. long, ovate-acuminate, puberulent on the midrib. Petals 10-15 mm. long, anterior exceeding laterals. Stamens ten, unequal, two longer; anthers 6-8 mm. long, purple. Legumes 3-4.5 cm. long, 4-5 mm. wide, appressed-puberulent with an evident beak, 1-2 mm. long. Seeds six to nine, 3 mm. long.

Sandy soil, Staked Plains of northwestern Texas, southwestern Kansas and eastern New Mexico.

KANSAS. Morton: Richfield, *J. N. Rose* 17169 $\cong$ September 20 (U).

TEXAS. Hemphill: Canadian, *A. H. Howell* 87 > July (U). "Staked Plains," *G. W. Holstein* (A).

NEW MEXICO. Quay: Logan, *G. L. Fisher* 93 > October 5 (U).

8. CHAMAECRISTA FASCICULATA (Michx.) Greene

Cassia fasciculata Michx. Fl. Bor. Amer. 1: 262. 1803. "*Hab.* in Pennsylvania et Virginia." Type not seen nor verified, but description sufficiently indicates this plant.

Chamaecrista fasciculata ["*fascicularis*"] Greene, Pittonia 3: 242. 1897.

Chamaecrista bellula Pollard, Proc. Biol. Soc. Wash. 15: 19. 1902.

"Type in the United States National Herbarium, collected by Prof. S. M. Tracy at St. Vincent, Florida, September 9, 1899 (No. 6,326)." Type, collected September 4, 1899, seen in the United States National Herbarium. Perhaps a small-leaved form of the southern Coastal Plain.

Chamaecrista camporum Greene, Pittonia 5: 108. 1903. "Type specimens collected by myself at Monticello, Illinois, 7 August, 1899." Type not seen nor verified, but description evidently of this species.

Cassia Chamaecrista L. (Sp. Pl. 379. 1753. "*Habitat in* Jamaica, Barbados, Virginia") is composite, and should be typified by "*Chamae Crista pavonis americana, siliqua multiplici*," Breyn. Cent. 66: pl. 24, from Curaçao. This is the species usually known as *Cassia diffusa* DC., an ally of *C. nictitans* L. The Linnaean diagnoses, here, in Hort. Ups. 101, 1748, and in Hort. Cliff. 158, 1737, will apply to this, the phrase "*glandula petioli pedicellata*" directly excluding our plant.

Annual. Stem erect, 3–9 dm. tall, much branched, puberulent in lines with ascending incurved hairs. Stipules linear-attenuate, glabrous or nearly so, ciliate, many-nerved, 5–10 mm. long. Petioles 5–8 mm. long, puberulent with incurved hairs. Petiolar gland single, near middle or toward distal end of petiole, sessile or nearly so, depressed saucer-shaped, round or slightly oval, 0.5–1.5 mm. wide, dark brown to brown. Leaflets six to twelve (or fifteen) pairs, 10–20 mm. long, 2–5 mm. wide, oblong-linear, obtuse to acute, shortly mucronulate to mucronate, glabrous (rarely very finely puberulent), finely ciliolate, paler beneath, evidently nerved. Bracteoles 3–5 mm. long, linear-attenuate. Pedicels one to six in a fascicle, 10–20 mm. long, finely or sparsely puberulent with incurved (rarely somewhat spreading, then short) hairs. Sepals 9–12 mm. long, lanceolate-acuminate, more or less pubescent on the midrib. Petals 10–17 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, two longer; anthers 8–10 mm. long, yellow or reddish (especially southwestward). Legumes 4–5 cm. long, 5–5.5 mm. wide, appressed-puberulent or glabrate on the sides, with a beak usually short but reaching 1.5 mm. long. Seeds six to fifteen, 3–3.2 mm. long.

Moist to dry, usually sandy, open places, southeastern Massachusetts to Florida and central Texas, inland to northern Ohio, southern Minnesota and central Kansas. Abundant in many parts of the southeast, especially in the Atlantic Coastal Plain. Northeast of Virginia, rare above the Fall Line, on the Serpentine and occasionally elsewhere in southeastern Pennsylvania.

Variable, and doubtless hybridizes with allied species. South-eastward probably passes into the little-known variety γ southward through the lower Alleghenies and the lower Mississippi valley passes into the very pronounced variety β .

MASSACHUSETTS. Barnstable: Woods Hole, *T. Morong* > August 10 (Y); also Plymouth County.

RHODE ISLAND. Providence: East Providence, *J. F. Collins* > August 26 (U); also Washington County.

CONNECTICUT. Fairfield: Greens Farms, *C. L. Pollard* 232 $\geq$ August 16 (U).

NEW YORK. Nassau: Long Beach, *F. W. Pennell* 2312 $\geq$ October 12 (Y); also Bronx, Richmond, Suffolk and Westchester Counties.

NEW JERSEY. Cape May: Cape May, *F. W. Pennell* 2223 > August 4 (U); also Atlantic, Bergen, Camden, Cumberland, Gloucester, Middlesex, Monmouth, Ocean, Passaic and Somerset Counties.

PENNSYLVANIA. Delaware: Williamson School (serpentine). *F. W. Pennell* 1640 (Y); also Allegheny, Beaver, Berks, Chester, Dauphin, Huntingdon, Lancaster and Montgomery Counties.

DELAWARE. Sussex: Milton, *A. Commons* > August 17 (A).

MARYLAND. Cecil: Bacon Hill, *F. W. Pennell* 1616 > August 4 (Y); also Dorchester and Queen Anne Counties.

VIRGINIA. Princess Anne: Virginia Beach, *T. H. Kearney* 2136 < October 6 (U); also Accomac, Fairfax, Hanover, Norfolk and Warren Counties.

WEST VIRGINIA. Jefferson: Harpers Ferry, *Detwiller*, August 6 (A).

NORTH CAROLINA. Buncombe: Biltmore, *Biltmore herbarium* 180b > July 30 (P, U, Y); also Carteret, Cherokee, Craven, Forsyth, Orange, Polk and Rowan Counties.

SOUTH CAROLINA. Orangeburg: Eutawville, *W. W. Eggleston* 4980 > September 6-11 (Y); also Aiken and Berkeley Counties.

GEORGIA. Chattooga: Summerville, *C. L. Pollard & W. R. Maxon* 446 > August 7-8 (U). Gilmer: Ellijay, *J. K. Small* > August 13-16 (Y). Sumter: *R. M. Harper* 1003 > July 5 (U, Y). Whitfield: Dalton, *R. M. Harper* 396 > August 10 (U, Y).

FLORIDA. Franklin: St. Vincent (Id.), *S. M. Tracy* 6326 < September 4 (U, Y).

ALABAMA. Clay: Talladega Creek, *C. Mohr* > August 1 (U). Dekalb: Mentone, *C. Mohr* $\geq$ September 2 (U). Jefferson: Bir-

mingham, *C. Schuchert* > October 9 (U, Y). Lee: Auburn,* *F. S. Earle* & *C. F. Baker* > August 17 (Y).

MISSISSIPPI. Carroll: *E. Smith* (U).

TENNESSEE. Chester: Henderson, *S. M. Bain* 54 p.p > August (Y). Knox: Knoxville, *A. Ruth* 2202 > June (Y). Marion: South Pittsburg, *C. L. Pollard* & *W. R. Maxon* 409 > August 3-4 (U, Y). Monroe: Madisonville, *F. L. Scribner* > August (U). Roane: Post Oak Springs, *C. L. Pollard* & *W. R. Maxon* 413 > August 6 (U).

KENTUCKY. On Red River, *R. Peter* > July (Y).

OHIO. Erie: Oxford prairie, *E. L. Moseley* > August 6 (U).

INDIANA. Newton: Roselawn, *H. Hahn* (U).

ILLINOIS. Cook: Calvary,* *F. C. Gates* > August 21 (U); also Vermilion* County.

WISCONSIN: Trempeleau: Trempeleau, *T. J. Hale* (A).

MINNESOTA. Brown: Sleepy Eye, *E. P. Sheldon* > July (U, Y); also Houston and Nicollet Counties.

SOUTH DAKOTA. Minnehaha: Sioux Falls, *Thornber* > August (U).

IOWA. Story: Ames, *L. H. Pammel* & *C. R. Ball* 20 > July 18 (U, Y); also Buchanan, Decatur, Fayette, Hardin and Johnson Counties.

NEBRASKA. Lancaster: Lincoln, *J. G. Smith* > September (C); also Cass County.

MISSOURI. Greene: Springfield, *P. C. Standley* 8322 > August 28 (U). Jackson: Courtney, *B. F. Bush* 6489 $\geq$ August 19 (U, Y). Marion: Oakwood, *J. Davis* 302 > July 17 (U). Mississippi: Charleston, *O. Kuntze* 2862 < September 9 (Y). St. Louis: St. Louis, *N. Riehl* 87 > August (Y). Washington: Potosi, *F. Peck* (U).

KANSAS. Geary: Fort Riley, *E. E. Gayle* 538 > July 20 (Y); also Douglas, Lyon, Riley and Shawnee Counties.

ARKANSAS. Miller: Texarkana, *A. A. & E. G. Heller* 4133 > August 23 (A, U, Y) (leaflets minutely puberulent). Nevada: 4 m. se. of Prescott, *M. P. Hollister* 25 > June 17 (U). Pulaski: Little Rock, *H. E. Hasse* (Y).

OKLAHOMA. Creek: Sapulpa, *F. W. Pennell* 5392 > September 8 (P). Payne: Stillwater, *F. A. Waugh* 358 (U).

* Approaching *C. fasciculata* β .

LOUISIANA. Caddo: Shreveport, *Gregg* > September 4 (A).

TEXAS. Hays: San Marcos and vicinity, *S. W. Stanfield* (Y).
 Parker: Weatherford, *S. M. Tracy 8026* > June 3 (P, Y). Travis:
 Austin, *F. W. Pennell 5430* > September 13 (P) (anthers purple).
 Walker: Huntsville, *R. A. Dixon 400* > July 9-12 (Y).

8a. CHAMAECRISTA FASCICULATA β

Cassia Chamaecrista robusta Pollard, Bull. Torrey Club 21: 218.
 1894. "Type a single specimen in the Columbia College
 Herbarium collected by Dr. C. W. Short in the mountains of
 Kentucky." Type seen in the herbarium of Columbia Uni-
 versity at the New York Botanical Garden.

Cassia robusta Pollard, *l.c.* 24: 150. 1897.

Chamaecrista robusta Pollard; Heller, Cat. N. A. Pl. 2d ed. 5.
 1900.

Stem stouter, 6-15 dm. tall, more or less densely hirsute above
 with spreading hairs. Stipules lanceolate-attenuate, 10-14 mm.
 long. Petioles hirsute-pubescent. Leaflets nine to eighteen
 pairs, 15-20 mm. long, 3-6 mm. wide. Bracteoles 4-6 mm. long.
 Pedicels 15-25 mm. long, hirsute with spreading hairs. Sepals
 hirsute on the midrib. Petals 15-20 mm. long. Legumes 5-7
 cm. long, 6-7 mm. wide, hirsute-pubescent. Otherwise as in the
 species.

Moist to dry soil, more frequently in low ground, and most
 abundant on alluvial soil, southern Ohio to northern Florida,
 eastern Missouri and Louisiana. Throughout the lower Mississippi
 valley, mostly in alluvial soil; also pushing up into the valleys of
 the southern Alleghenies. In southern Louisiana, where I have
 collected it, seemingly quite distinct from *C. fasciculata*, but study
 of specimens shows a surprising number of intermediates.

GEORGIA. Clarke: *R. M. Harper* > (Y). Floyd: Rome, *G.*
McCarthy 311 > July (U).

FLORIDA. Leon: Tallahassee, *N. K. Berg* (Y).

ALABAMA. Baldwin: Tensaw, *S. M. Tracy 8009, 8038* >
 August 22 (P, U, Y). Barbour: Eufaula, *G. McCarthy* > August
 (U). Clay: Delta, *C. Mohr* (U). Lee: Auburn, *F. S. & E. S.*
Earle 30 > September 14 (U, Y).*

* Approaching the typical form of the species.

MISSISSIPPI. Franklin: Florence, *E. G. Holt* 17 > July 25 (U). Jasper: *S. Deavoms* 2942 (U). Noxubee: Prairie Point, *Mrs. P. A. L. Carpenter* $\cong$ October (U). Oktibbeha: Agricultural College, *C. L. Pollard* 1276 > August 11-17 (U, Y).

TENNESSEE. Chester: Henderson, *S. M. Bain* 54 p.p. > August (U, Y). Franklin: Cowan, *A. Ruth* > July (U).*

KENTUCKY. Lincoln: Crab Orchard, *C. W. Short* (A). "Mountains of Kentucky," *C. W. Short* (A, Y).

OHIO. "In ditioe Miami," *Dr. Frank* (U).

ILLINOIS. Cass: Little Indian, *F. C. Gates* > July 7 (U). Peoria: Peoria, *F. E. McDonald* > September (Y). Richland: *R. Ridgway* (U).

MISSOURI. Polk: Graydon Springs, *P. C. Standley* 9895 $\cong$ September 7 (U). St. Louis: St. Louis, *O. Kuntze* 2773 > September 6 (Y).

ARKANSAS. Ouachita: Camden, *A. H. Howell* 618 > July 7 (U).

LOUISIANA. Avoyelles: Marksville, *W. L. McAtee* 2185 > September 12 (U). West Feliciana: Baines, *F. W. Pennell* 4275 > August 21 (P, Y).

8b. CHAMAECRISTA FASCICULATA γ

Cassia depressa Pollard, Bull. Torrey Club 22: 515. pl. 25. 1895.

"Low pine woods, River Junction, Gadsden Co., Florida. G. V. Nash, September 5, 1895 (no. 2571)." Type seen in the herbarium of Columbia University at the New York Botanical Garden.

Chamaecrista depressa Greene, Pittonia 3: 242. 1897.

Stems spreading-ascending, slender, 1-3 dm. tall, diffusely branched below. Petioles 2-5 mm. long. Petiolar gland .3-1 mm. wide. Leaflets six to ten pairs, 8-12 mm. long, 2-3 mm. wide. Bracteoles 3-4 mm. long. Pedicels 1-3 in a fascicle, hirsute with spreading, and also in part with fine incurved hairs. Sepals 8-10 mm. long, hirsute on the midrib. Legumes spreading-pubescent. Otherwise as in the species. Not satisfactorily known, but certainly not a distinct species.

Open pine-woods, Apalachicola River hills, northwestern Florida.

FLORIDA. Gadsden: Chattahoochee, *S. M. Tracy* 3956 >

August 23 (U, Y); River Junction, *A. H. Curtiss* 5980 > September 8 (U, Y).

9. CHAMAECRISTA MISSISSIPPIENSIS (Pollard) Pollard

Cassia mississippiensis Pollard, Bull. Torrey Club 21: 219.

1894. "Type in herbarium of Columbia College, collected by Miss K. Skeeahan, 1889, at Ocean Springs, Mississippi." Type collected November 7, 1889, seen in the herbarium of Columbia University at the New York Botanical Garden. Several specimens on sheet; these, originally described as "suffruticose," are apparently lateral shoots of a dwarfed diffusely branched plant.

Chamaecrista mississippiensis Pollard; Heller, Cat. N. A. Pl. 2d ed. 5. 1900.

Chamaecrista Tracyi Pollard, Proc. Biol. Soc. Wash. 15: 21.

1902. "Type in the United States National Herbarium, collected by Prof. S. M. Tracy at Koshtaw, Miss., September 15, 1898." Type, *Tracy* 4914, collected October 15, 1898, seen in the United States National Herbarium.

Annual. Stem erect or ascending, 2-6 dm. tall, slender, often diffusely branched at base, finely puberulent with ascending incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, ciliate, 4-7 mm. long. Petioles 2-5 mm. long, puberulent with incurved hairs. Petiolar gland single, sessile, depressed saucer-shaped, .3-.6 mm. wide, dark-brown. Leaflets six to fifteen pairs, 5-12 mm. long, 2-3 mm. wide, ellipsoid linear-lanceolate, acutish to acute-mucronate, appressed-puberulent, not ciliate, obscurely nerved. Bracteoles 2-3 mm. long, linear-attenuate. Pedicels one to three in a fascicle, 6-15 mm. long, finely puberulent with incurved hairs. Sepals 5-10 mm. long (in the bud longer than the petals), linear-lanceolate, long-attenuate, appressed-puberulent. Petals 8-15 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, two longer; anthers 7-9 mm. long, yellow. Legumes 3-5 cm. long, 5 mm. wide, appressed-puberulent. Seeds six to fifteen.

Moist sandy pine-land, southern Mississippi and Louisiana, extending apparently into southern Alabama and southeastern Texas.

ALABAMA. Lee: Auburn, *F. S. Earle* & *C. F. Baker* > August (U).

MISSISSIPPI. Copiah: *L. R. Gibbes* > August (Y). Harrison: Biloxi, *F. W. Pennell 4378* > August 28 (P). Jackson: Scranton, *S. M. Tracy 4436* > August 29 (U).

LOUISIANA. Caddo: Shreveport, *F. S. Earle* > June (Y). Plaquemines: Breton Island, *S. M. Tracy & F. E. Lloyd 198 p.p.* > August 17 (P). Rapides: Alexandria, *C. R. Ball 540 p.p.* > June 3 (U, Y). St. Landry: Opelousas, *C. Mohr* > March 15 (U). St. Tammany: Abita Springs, *F. W. Pennell 4228* > August 16 (P, Y).

TEXAS. Harris: La Porte, *G. L. Fisher 643* > August 15 (U).

9a. CHAMAECRISTA MISSISSIPPIENSIS β

Chamaecrista littoralis Pollard, Proc. Biol. Soc. Wash. 15: 20. 1902. "Type, No. 371,572 in the United States National Herbarium, collected by Prof. S. M. Tracy and Prof. F. E. Lloyd on Breton Island, La., August 17, 1900 (No. 198)." Type seen in the herbarium of the United States National Museum.

Stems mostly stouter, 4–8 dm. tall, erect. Leaflets 7–15 mm. long. Pedicels hirsute with spreading, sometimes also with shorter incurved hairs. Legumes hirsute-pubescent. Otherwise as in the species.

Sandy soil, in the Coastal Plain, mostly near the Gulf coast, on dunes and in pine-land, western Florida to eastern Texas.

FLORIDA. Wakulla: St. Marks, *F. Rugel* > June (Y).

ALABAMA. Mobile: Hollanders Island, *F. W. Pennell 4506* > September 2 (P, Y); Theodore, *F. W. Pennell 4444* > August 30 (P, Y).

MISSISSIPPI. Clarke: Shubuta, *C. Schuchert* > October 11 (U). Harrison: Cat Id., *F. E. Lloyd & S. M. Tracy 183* $\geq$ August 26 (U, Y). Jackson: Horn Id., *S. M. Tracy 6927* > July 14 (U). Wayne: Waynesboro, *C. L. Pollard 1217* > October 8–9 (U, Y).

LOUISIANA. Calcasieu: Lake Charles, *S. M. Tracy 3957* > August 7 (U). Plaquemines: Breton Island, *F. E. Lloyd & S. M. Tracy 198 p.p.* < August 17 (U, Y).

TEXAS. San Augustine: San Augustine, *G. L. Crockett* (U).

10. CHAMAECRISTA PUBERULA Greene

Chamaecrista puberula Greene, Pittonia 5: 134. 1903. "On Galveston Island [Texas], 23 Sept. 1901 [S. M. Tracy]." Co-type of Tracy, 7797, seen in the herbarium of the New York Botanical Garden.

Annual. Stem erect, 4–8 dm. tall, puberulent with ascending-incurved hairs. Stipules lanceolate-acuminate, nerved, puberulent, finely ciliate, 4–5 mm. long. Petioles 3–6 mm. long, puberulent with incurved hairs. Petiolar gland single, short-pedicel to sessile, discoid to slightly saucer-shaped, 0.5–1 mm. wide, dark-brown. Leaflets ten to fifteen pairs, 10–18 mm. long, 2–4 mm. wide, linear-lanceolate, acutish to acute-mucronate, densely puberulent, not ciliate, midrib evident, elsewhere obscurely nerved. Bracteoles 1–2 mm. long, lanceolate-ovate. Pedicels one to three in a fascicle, 5–20 mm. long, puberulent with incurved hairs. Sepals 6–8 mm. long (in the bud shorter than the petals), ovate-lanceolate, acute to short-acuminate, pubescent. Petals 10–15 mm. long, anterior slightly exceeding laterals. Stamens 10, unequal, 2 longer; anthers 4–5 mm. long, deep purple. Legumes 5–6 cm. long, 4–5 mm. wide, appressed-puberulent. Seeds eight to fourteen, 3.7–4 mm. long.

Moist to dry sandy soil, southern Texas.

TEXAS. Colorado: Sheridan, *F. W. Pennell* 5538 > September 21 (P, Y). Dewitt: Cuero, *A. H. Howell* 252 > July 7 (U). Galveston: Galveston, *F. W. Pennell* 5574 > September 23 (P, Y). Lavaca: Hallettsville, *G. L. Fisher* 126 $\geq$ August (U). Nueces: Kings Ranch, *V. Bailey* 251 > May 10 (U). Robertson: Hearne, *F. W. Pennell* 5418 > September 11 (P, Y). Webb: Laredo, *A. Schott* 110 > June (Y). Wharton: Pierce, *S. M. Tracy* 7796 > September 16 (U, Y), anther-sacs yellowish or reddish.

11. CHAMAECRISTA LEPTADENIA (Greenman) Cockerell

Cassia leptadenia Greenman, Proc. Amer. Acad. 41: 238. 1905. "48 km. east of El Paso, May to October, 1849, *Chas. Wright*, no. 154 (hb. Gray)." Co-type seen in the United States National Herbarium.

Chamaecrista leptadenia Cockerell, Muhlenbergia 4: 68. 1908.

Annual. Stem erect, slender, 1–5 dm. tall, sparingly branched, puberulent in lines with incurved to spreading hairs. Stipules

linear-attenuate, glabrous or nearly so, conspicuously ciliate, nerved, 5-7 mm. long. Petioles 2-5 mm. long, puberulent with incurved hairs. Petiolar gland single, stalked, discoid, 0.2-0.3 mm. wide, nearly black, stalk brown. Leaflets twelve to sixteen pairs, 8-12 mm. long, 1-2 mm. wide, oblong-linear, acutish, mucronate-tipped, glabrous, strongly ciliate, obscurely nerved. Bracteoles 1-1.7 mm. long, lanceolate. Pedicels one or two in a fascicle, 3-5 mm. long, appressed-puberulent. Sepals 4-5 mm. long, lanceolate, acuminate, hirsute. Petals 3-6 mm. long, anterior twice exceeding laterals. Stamens unequal; anthers 2 mm. long, yellow (?). Legumes 3-4.2 cm. long, 3-4 mm. wide, appressed-puberulent. Seeds ten to eighteen, 3 mm. long, very thin, light-brown.

Dry soil, western Texas to southeastern Arizona.

TEXAS. El Paso: *C. Wright* 154 (U). Presidio: Chenates region, *G. C. Nealley* 541 (U).

NEW MEXICO. Dona Ana: Organ Mountains, *E. O. Wooton* 435 < September 1 (Y). Luna: Floridas, *A. I. Mulford* 1038a > August 2 (Y).

ARIZONA. Cochise: Bowie; Chiricahua Mts., *J. C. Blumer* 2086 > August 30 (U); Fort Huachuca; Tucson. Pima: Santa Rita Mountains, *D. Griffiths* & *J. J. Thornber* 212 (U, Y).

12. CHAMAECRISTA NICTITANS (L.) Moench

Cassia nictitans L. Sp. Pl. 380. 1753. "*Habitat in* Virginia."

Typified by L. Hort. Cliff. 497. *pl.* 36, 1737, where an excellent description and figure are given.

Cassia procumbens L. *Lc.* 380. 1853. "*Habitat in* Indiis."

Based wholly upon "*Cassia americana procumbens*, herbacea, mimosae foliis, floribus parvis, siliquis angustis, planis," A. J. A[mmann], *Comm. Petrop.* 12: 238-242 (cited erroneously by Linnaeus as "*Comm. petrop. t. 11*"). This is fully described and is unquestionably *Chamaecrista nictitans* (L.) Moench. The type-locality is stated "*circa Philadelphiam urbem in Pennsylvania, Americae septentrionalis provincia, sitam.*" There appears to have been no specimen in the Linnean herbarium in 1753, and the species is not checked by Linnaeus until his third list in 1767. The West Indian plant known until recently by this name has been described by Dr.

Britton as *Chamaecrista micrantha* Britton, Bull. Torrey Club 43: 463. O 20 1916.

Chamaecrista nictitans Moench, Meth. 272. 1794.

Nictitella amena Raf. Sylv. Tellur. 128. 1838. New name for *Cassia nictitans* L., type of the genus *Nictitella* Raf.

Cassia Chamaecrista nictitans Kuntze, Rev. Gen. Pl. 1: 169. 1891.

Chamaecrista nictitans commixta Pollard & Maxon, Proc. Biol. Soc. Wash. 14: 163. 1901. "Type in U. S. National Herbarium, No. 357,069, collected by Charles L. Pollard and William R. Maxon in alluvial soil along the New River at Quinnimont, W. Va., August 21, 1899 (No. 31)." Type seen in the United States National Herbarium.

Cassia nictitans commixta Millsp. W. Va. Geol. Surv. 5: 283. 1913.

Annual. Stem erect, 1-4 dm. tall, much branched, puberulent with incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, ciliate, nerved, 5-8 mm. long. Petioles 4-9 mm. long, puberulent with incurved hairs. Petiolar gland single, shortly below proximal leaflets, stalked, discoid or nearly so, 0.3-0.8 mm. wide, dark-brown. Leaflets nine to eighteen pairs, 7-15 mm. long, 2-4 mm. wide, oblong-linear, obtuse, mucronate, glabrous, not ciliate, paler beneath, obscurely nerved. Bracteoles 1.5-2 mm. long, lanceolate. Pedicels one to two or three in a fascicle, 2-4 mm. long, appressed-puberulent. Sepals 3-4 mm. long, lanceolate, acuminate, puberulent on the midrib. Petals 3-8 mm. long, anterior twice exceeding laterals. Stamens unequal, five; anthers 2 mm. long, pinkish. Legumes 2.5-4 cm. long, 4-6 mm. wide, appressed-pubescent. Seeds six to nine, 3 mm. long, thick, dark-brown.

Sandy soil, or sterile soil, frequently along roadsides, probably near the borders of its range introduced, southern Vermont and Rhode Island, to eastern Kansas, Georgia and Texas.

VERMONT. Windham: Vernon, A. J. Grout > August 6 (U).

RHODE ISLAND. Providence: Elmwood, J. F. Collins > August 25 (U).

CONNECTICUT. Fairfield: Bridgeport, E. H. Eames < September 14 (U).

NEW YORK. Westchester: Mount Kisco, F. W. Pennell 6713 < September 26 (Y); also Albany, Bronx, Orange, Putnam, Queens, Rensselaer, Richmond and Suffolk Counties.

NEW JERSEY. Bergen: Alpine, *F. W. Pennell* 6532 < September 12 (Y); also Atlantic, Burlington, Camden, Cape May, Gloucester, Middlesex, Morris, Ocean and Sussex Counties.

PENNSYLVANIA. Chester: Unionville, *F. W. Pennell* 992 < October 3 (A); also Beaver, Berks, Bucks, Delaware, Lancaster, Lehigh, Montgomery, Northampton and Philadelphia Counties.

DELAWARE. Sussex: Milton, *A. Commons* > August 17 (A); also Kent and Newcastle Counties.

MARYLAND. Queen Anne: *E. G. Vanatta* > August 29 (A).

VIRGINIA. Augusta: Staunton, *W. A. Murrill* < September 5 (Y); also Botetourt, Hanover, and Princess Anne Counties.

WEST VIRGINIA. Fayette: Quinimont, *C. L. Pollard & W. R. Maxon* 31, 39 $\geq$ August 21 (U, Y); also Ritchie County.

NORTH CAROLINA. Buncombe: Biltmore, *Biltmore Herbarium* 181b > August 14, < September 28 (P, U, Y); also Cherokee, Craven, Haywood, Iredell, Orange, Polk and Swain Counties. Pasquotank: Elizabeth City, *F. L. J. Boettcher* 291 > August 26 (U, Y) (leaflets but 6–7 mm. long and pubescence of upper part of stem spreading; perhaps a coastal form).

SOUTH CAROLINA. Pickens: Six Mile Creek, *H. D. House* 3078 < October 22 (U).

GEORGIA. Chattooga: Summerville, *C. L. Pollard & W. R. Maxon* 435 > August 7–8 (U). DeKalb: Stone Mountain, *C. L. Pollard & W. R. Maxon* 463 > August 10–12 (U). Whitfield: Dalton, *R. M. Harper* 395 > August 10 (U, Y).

ALABAMA. Clay: Elders, *C. Mohr* > July 30 (U). Dekalb: Mentone, *C. Mohr* > September 1 (U). Lee: Auburn, *F. S. Earle* > September 12 (Y).

MISSISSIPPI. Claiborne: Martin, *J. W. White* 2944 > September 12 (U). Oktibbeha: Starkville, *S. M. Tracy* 1422 < September 1 (U, Y).

TENNESSEE. Knox: Knoxville, *A. Ruth* 291 $\geq$ August (Y).

KENTUCKY. Bell: Pine Mt., *T. H. Kearney* 496 < September (U); also Lyon County.

OHIO. Fairfield: Lancaster, *W. A. Kellermann* > August 18 (U).

INDIANA. Lake: Tolleston, *V. H. Chase* 298 < September 23 (A).

- ILLINOIS. Henderson: Oquawka, *H. N. Patterson* (U).
 MISSOURI. Barry: Eagle Rock, *B. F. Bush* 44 < September 28 (U, Y); also Greene, St. Louis and Scott Counties.
 KANSAS. Cherokee: *A. S. Hitchcock* 668 (U, Y).
 ARKANSAS. Benton: *E. N. Plank* (Y). Pulaski: Little Rock, *H. E. Hasse* > August 26 (Y).
 OKLAHOMA. Le Flore: "9 m. west of Fort Smith," *J. M. Bigelow* (U).
 LOUISIANA. Rapides: Alexandria, *J. Hale* (Y). West Feliciana: Catalpa, *F. W. Pennell* 4278 > August 21 (P, Y).
 TEXAS. Burnet: Marble Falls, *E. N. Plank* > August 10 (Y).

12a. CHAMAECRISTA NICTITANS β

- Cassia multipinnata* Pollard, Bull. Torrey Bot. Club 22: 515. *pl.* 250. 1895. No type indicated, and first specimen listed, Curtiss 712 (cited as "512"), is composite, consisting of plant described and in part of *Chamaecrista aspera*. Second specimen cited, "Near Jacksonville, A. H. Curtiss, North American Plants . . . second distribution, No. 5157, September 15, and October 27, 1894," is taken as the type. Type seen in the herbarium of the United States National Museum.
- Cassia multipinnata Nashii* Pollard, *l.c.* 515. 1895. "Collected in low pine woods, River Junction, Gadsden Co., Florida, by Mr. Nash, Sept. 5, 1895 (2577)." Type seen in the herbarium of the New York Botanical Garden.
- Chamaecrista multipinnata* Greene, Pittonia 3: 243. 1897.
 Stem 1-5 dm. tall. Stipules linear-attenuate. Leaflets fifteen to twenty-six pairs, 1-2 mm. wide. Legumes 4-5 mm. wide. Seeds six to twelve. Otherwise as in the species.
- Sandy soil, in the Coastal Plain, especially in the pine-land, South Carolina to southern Mississippi. In the long-leaf pine-land replacing the species, of which it may be no more than an ecological form.
- SOUTH CAROLINA. Aiken: Aiken, *H. W. Ravenel* (U).
 GEORGIA. Bibb: Macon, *J. M. Green* (A). Brooks: Quitman, *R. M. Harper* 1632 > September 13 (U, Y). Burke: *M. H. Hopkins* 19 > September 9 (Y). Sumter: Americus, *S. M. Tracy* 3958 > August 20 (U).

FLORIDA. Alachua: Gainesville, *H. S. Fawcett* < November (P). Duval: Jacksonville, *A. H. Curtiss 5157* > September 15 (U). Gadsden: River Junction, *G. V. Nash 2577* > September 5 (A, Y). Leon: Tallahassee, *G. V. Nash 2403* > August 12 (U, Y). Wakulla: St. Marks, *F. Rugel 199* > September (U).

ALABAMA. Baldwin: Daphne, *C. Mohr* > August 18 (U), Cullman: Ryans Creek, *C. Mohr* < August 6 (U). Lee: Auburn. *C. F. Baker 31* < October 10 (Y). Mobile: Theodore, *F. W. Pennell 4445* > August 30 (P, Y).

MISSISSIPPI. Clarke: Shubita, *C. Schuchert* < October 11 (U). Harrison: Pass Christian, *F. W. Pennell 4362* > August 27 (P, Y). Jackson: Ocean Springs, *S. M. Tracy 4434* > August 20 (U). Simpson: Saratoga, *S. M. Tracy 8505* > August 6 (P, U, Y).

12b. CHAMAECRISTA NICTITANS γ

Cassia aspera Mohrii Pollard, Bull. Torrey Club 24: 151.

Mar. 30, 1897. "Type in the herbarium of the U. S. Geol. Surv. of Alabama, collected in Mobile in 1878 by Dr. Mohr."

Probable co-type, lacking statement of date, seen in the United States National Herbarium.

Chamaecrista aspera Mohrii Pollard; Heller, Cat. N. Am. Pl. 2d ed. 5. Nov. 10, 1900.

Stem 3-5 dm. tall, densely puberulent to spreading-pubescent. Stipules more ciliate, 8-10 mm. long. Leaflets 18-23 pairs, 9-12 mm. long, 2 mm. wide, narrowly oblong-linear, acute, strongly mucronate-tipped, pubescent with incurved hairs. Sepals hirsute-pubescent, especially on midrib. Legumes more hirsute. Otherwise as in the species.

Sandy soil in the Coastal Plain, southern Georgia to Louisiana and southern Arkansas. Insufficiently known, but probably not specifically distinct.

GEORGIA. Decatur: *E. A. Smith* (U).

ALABAMA. Mobile: Mobile, *C. Mohr* (U).

ARKANSAS. Miller: Texarkana, *A. A. & E. G. Heller 4134* > August 23 (A, U, Y).

LOUISIANA. Caddo: Shreveport, *Gregg* > September 6 (U). Rapides: Alexandria, *J. Hale* (Y).

13. CHAMAECRISTA ASPERA (Muhl.) Greene

Cassia aspera Muhl.; Ell. Bot. S. C. & Ga. 1: 474. 1821. "On Eding's island near Beaufort [South Carolina], common."

Type not seen nor verified, but description sufficiently indicates this plant.

Nictitella aspera Raf. Sylv. Tell. 128. 1838.

Chamaecrista aspera Greene, Pittonia 3: 243. 1897.

Annual. Stem erect, 3-7 dm. tall, branched, strigose-hirsute with spreading hairs, below mostly also puberulent with some shorter incurved hairs. Stipules lanceolate-attenuate, conspicuously ciliate, nerved, 8-11 mm. long. Petioles 2-5 mm. long, hirsute, as well as the rachis, with spreading hairs. Petiolar gland single, shortly below proximal leaflets, stalked, truncate, scarcely wider than the stalk, 0.15-0.25 mm. wide, brown or dark-brown. Leaflets fifteen to twenty-seven pairs, 8-15 mm. long, 1.5-2 mm. wide, narrowly oblong-linear, acute, strongly mucronate, glabrous, not ciliate, slightly glaucous beneath, obscurely nerved. Bracteoles 1.5-2 mm. long, lanceolate. Pedicels one to two or three in a fascicle, 3-4 mm. long, appressed-puberulent. Sepals 3-5 mm. long, lanceolate, acuminate, strigose-hirsute on the midrib. Petals 3-7 mm. long, anterior nearly or twice exceeding laterals. Stamens unequal, seven to nine; anthers 2 mm. long, "yellow." Legumes 1.5-2.5 cm. long, 4-5 mm. wide, strigose-hirsute. Seeds three to eight, 2.5 mm. long, 2 mm. wide, thick.

Sandy soil, hammocks, fields or in pine-land, peninsular Florida, extending northward along the Atlantic coast to southern South Carolina.

FLORIDA. Dade: Miami, *N. L. Britton* 456 > April 4 (Y). Duval: Jacksonville, *A. H. Curtiss* 5158 > September 19 (U, Y). Hillsboro: Tampa, *N. L. Britton & P. Wilson* 82 > August 25 (Y). Lake: Eustis, *G. V. Nash* 1717 > August 16-25 (A, U, Y). Lee: Alva, *A. S. Hitchcock* 56 (U, Y). Manatee: Perico Id., *S. M. Tracy* 7244 > May 14 (U, Y). Monroe: Key West, *Blodgett* (U, Y). Orange: Clarcona, *M. Meislahn* 35 > September 19 (U). Pinellas: St. Petersburg, *Mrs. C. C. Deam* 2751 > September 18 (U, Y).

13a. CHAMAECRISTA ASPERA β

Cassia Simpsoni Pollard, Bull. Torrey Club 21: 221. 1894.

"Florida—Big Pine Key, Simpson (May, 1891), No. 174.

Type, three specimens in the National Herbarium, collected by Mr. J. H. Simpson." Type seen in the United States National Herbarium.

Chamaecrista Simpsoni Pollard; Heller, Cat. N. A. Pl. 2d ed. 5. 1900.

Stem spreading, 1–3 dm. tall, diffusely branched, puberulent with incurved hairs below or throughout, hirsute with longer hairs only above or rarely throughout. Leaflets 9–19 pairs, 5–11 mm. long. Pedicels 2–3 mm. long.—Otherwise as in the species, with which it seems to completely intergrade. Pine-lands, extreme southern Florida.

FLORIDA. Dade: Cocoanut Grove, *N. L. Britton* 285 $\geq$ March 26 (Y); Fort Dallas; Homestead; Miami. Monroe: Big Pine Key, *F. W. Pennell* 9554 $\geq$ May 2 (Y); Boca Chica, *F. W. Pennell* 9613 $>$ May 15 (Y); Cudjoe, *F. W. Pennell* 9556 $\geq$ May 5 (Y); Key West; Little Pine Key; No Name Key.